

Original communication

## Suicidal and homicidal deaths: A comparative and circumstantial approach

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### Abstract

The incidence of suicide and homicide is on the increase worldwide, including India. One million people die annually due to suicides and homicides alone. A comparison of the results between suicides and homicides was performed. From a total of 5773 medicolegal deaths reported at an Apex medical centre of Nagpur University over a period of three years 1998–2000, only 241 cases (4.2%) were homicidal deaths in comparison to 1127 cases (19.5%) of suicidal deaths with suicide rate of 23.1/100,000 per year and homicide rate of 4.9/100,000 per year. Poisoning, burning, hanging and drowning forms the major methods of suicide in contrast to blunt trauma, sharp trauma, burning, and strangulation in homicide. Combined methods were more common in homicide as compared to suicide. Predominance of male was present in all methods of suicide and homicide, except burning. In general, male predominance was seen in both suicidal and homicidal deaths with peak age 21–30 years in suicides in contrast to 31–40 years in homicides. At younger age 11–20 years, the victims of suicide outnumbered the victims of homicide; but at extremes of ages below 10 years and above 60 years, homicides were relatively more common than suicides. Married victims were predominant in both types of deaths. Quarrel and revenge were the common precipitating cause/motive for homicide in comparison to chronic illness and mental illness for suicide. Majority of the accused were having close family relationship with the victims of suicide in contrast to homicides in which most of the assailant were having no family relationship with the victims. ‘Acquaintance’ were the accused in majority of the victims of homicides in contrast to ‘self’ in suicides. Most of the victims of homicide were killed outdoor in contrast to victim’s own domicile in suicides. In both suicidal and homicidal deaths, most of the victims were found in summer season, but the peaks were noticed in the months of April and May in suicidal deaths and October in homicidal deaths.

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### 1. Introduction

If aging and disease are eliminated and the world is made much safer (and/or surgical repair is vastly improved) so as to reduce the danger of death by accident,

the major causes of death will be suicide and homicide. It is believed that no matter how advanced the technology, people will always have the means of killing other people (homicide) and of killing themselves (suicide). One million people die annually worldwide due to suicides and homicides alone. Another 2.5 million people die each year because of accidents, burns, drowning, poisoning, falling from heights and from disaster.<sup>1</sup> With growth in the population, day to day frustration, stressful life, competition, and modern needs, the incidence of suicide as well as homicide is on the increase worldwide and in India.

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Many cases of suicides and homicides are straightforward and obvious to law enforcement agencies and to the victim's family. However, other cases are challenge to investigate and require thorough examination of all aspects of the case. Under section 306 and 309 of Indian Penal Code, which deals with abetment of suicide and attempt to commit suicide, the punishment can extend to ten years and one year respectively. Nevertheless, the punishment for murder is death or life imprisonment as per section 302 of Indian Penal Code. It is therefore important to distinguish between these two types of deaths so that innocent person is not charged with murder. Against this background, present study was undertaken with an aim to make comparison between suicide and homicide with specific emphasis on the incidence, methodology, age and gender, marital status, cause/motive, accused-victim relationship, crime scene and seasonal variation.

## 2. Materials and methods

The study attempted to review all medicolegal deaths during the period January 1998 to December 2000. All the autopsies had been performed in the mortuary, Forensic Medicine Department of Government Medical College at Nagpur, an urban district of Maharashtra, India. The district has a population of 4,067,637 spread in an area of 9802 km<sup>2</sup>. The centre is an Apex Medical Centre, where about 40% of the total medicolegal autopsies done across the district are performed here. The police department in India is legally bound to arrange autopsies in all medicolegal deaths. The medicolegal deaths are deaths occurring in unnatural (including suicidal, homicidal and accidental), suspicious or where cause of death is unknown. The accompanying police papers provide much of the information regarding age, sex, residence, marital status, reasons and manner of death whether accidental, suicidal, homicidal or natural. Hence the mortuary data and police records are selected as being most likely to represent the real incidence of suicide and homicide. Out of a total of 5773 medicolegal deaths, 1127 cases (19.5%) were due to suicidal deaths and 241 cases (4.2%) were due to homicidal deaths. The autopsy is followed by mandatory police inquiry and Magistrate's verdict report, especially in regard to manner of death. Hence, the police records were again reviewed for confirmation of information.

## 3. Results

### 3.1. Incidence of suicide and homicide

The incidence of suicide and homicide out of the total medicolegal deaths is shown in Table 1. Of the total 5773 medicolegal deaths during the period 1998–2000, only 241 cases (4.2%) were homicidal and 1127 cases (19.5%) were suicidal in nature with suicidal homicidal ratio equal to 4.7:1. In 3.9% cases the manner of death was not ascertained. There was a slow and steady rise in the suicidal deaths but decline in homicidal deaths over the period of three years. The suicide and homicide rate in the region is 23.1 and 4.9 per 100,000 population per year respectively.

### 3.2. Methods of suicide and homicide

The methods of suicide and homicide are shown in Table 2. In suicidal deaths, poisoning (42.3%) was the commonest method of suicide followed by burning (21.5%). Suicide by hanging (20.4%) being the third. Drowning was seen in 14.7% of the victims, while other methods due to run over by train (two cases), jumping from height (three cases), shooting (two cases) and electrocution (two cases) were rare. In homicidal deaths, injuries due to infliction of blunt trauma (41.1%) were the

Table 2  
Distribution of suicidal and homicidal deaths in relation to sex and method

	M	%	F	%	T	%
<i>I – Methods of suicide</i>						
Poisoning	361	51.3	116	27.4	477	42.3
Burning	70	9.9	172	40.7	242	21.5
Hanging	173	24.6	57	13.5	230	20.4
Drowning	89	12.6	77	18.2	166	14.7
Other	8	1.1	1	0.2	9	0.8
Combined methods	3	0.4	0	0.0	3	0.3
Total	704	62.5	423	37.5	1127	100.0
<i>II – Methods of homicide</i>						
Blunt trauma	86	43.7	13	29.5	99	41.1
Sharp trauma	84	42.6	7	15.9	91	37.8
Burning	3	1.5	21	47.7	24	10.0
Strangulation	5	2.5	3	6.8	8	3.3
Other	4	2.0	0	0.0	4	1.7
Combined methods	15	7.6	0	0.0	15	6.2
Total	197	81.7	44	18.3	241	100.0

Table 1  
Incidence of suicide and homicide out of total medicolegal deaths during the period 1998–2000 (*n* = 5773)

Manner of death	1998	%	1999	%	2000	%	Total	%
Suicidal	322	18.1	390	19.5	415	20.8	1127	19.5
Homicidal	94	5.29	86	4.3	61	3.1	241	4.2
Accidental	1006	56.6	1160	58.1	1181	59.1	3347	58.0
Natural	275	15.5	284	14.2	272	13.6	831	14.4
Unascertained	79	4.45	78	3.9	70	3.5	227	3.9
Total	1776	100.0	1998	100.0	1999	100.0	5773	100.0

most common method of homicide followed by sharp trauma (37.8%), homicide by burning (10%) being the third. Strangulation was seen in 3.3% of the victims, while other traumata due to shooting (three cases) or poisoning (one case) were rare.

Combined methods were more common in homicide as compared to suicide. In the total homicidal deaths, there were 15 cases (6.2%) in which several types of violence had been applied and where death was considered to be caused by a combination of method. In 12 cases sharp trauma was combined with blunt trauma and in two cases with strangulation. In one case blunt trauma was combined with strangulation. In suicidal death, only three cases (0.3%) were noted in which combined method was used for committing suicide.

Male predominance was seen in all methods of suicide and homicide, except burning. In females burning was the commonest method of suicide (40.7%) as well as homicide (47.7%).

### 3.3. Age and gender

The age and sex distribution is given in Table 3. In suicidal deaths, 62.5% of the victims were male and 37.5% were female with male female ratio of 1.7:1. The age ranges from 12 years to 80 years in male and 13 years to 72 years in female. 82% of the victims were between the ages of 11–40 years with peak incidence at 21–30 years (40.4%) followed by 31–40 years (24.2%). None of the victim of suicide was below the age of 10 years and only 2.7% were above the age of 60 years. But 17.4% of the victims were between the ages of 11–20 years.

Whereas in homicidal deaths, 81.7% of the victims were male and 18.3% were female with male female ratio equal to 4.5:1. The age ranges from 1 year to 79 years in male and 3 years to 62 years in female. 80% of the victims were between the ages of 21–50 years with peak incidence at 31–40 years (35.3%) followed by 21–30 years (29.5%). Five victims were below the age of 10 years and 8.3% were above the age 60 years. Only 5% of the victims were between the ages of 11–20 years.

### 3.4. Marital status

The distribution of marital status of the victims of suicide and homicide is given in Table 4. In suicidal deaths, 65.2% of the victims were married and 33% unmarried with married unmarried ratio equal to 2:1. The marital status was not known in 1.8% cases. In homicidal deaths, 69.3% of the victims were married and 24.1% unmarried with married unmarried ratio equal to 2.9:1. The marital status was not known in 6.6% cases.

### 3.5. Cause of suicide and homicide

Tables 5a and 5b highlights the various causes/precipitating factor of suicide and homicide respectively. In 31.4% cases of suicide, the cause for taking such an extreme step by the victim could not be ascertained by the investigating police officer in contrast to 18.7% cases of homicide where the motive was unknown.

In suicidal deaths, chronic illness was the commonest cause responsible for 13.7% of the suicides followed by mental illness in 10.4%, torture by in-laws in 9.1%, domestic problem in 8.4% and quarrel in 6.6%. Other important and socio-cultural factors related to suicides were under influence of alcohol, failure in love and examination, unemployment and infidelity. In five cases the victims committed suicide after killing one or more person.

In homicidal deaths, quarrel (44%) was the commonest precipitating factor/motive behind homicide followed by revenge in 20.7%. Other important causes of homicide include property/land dispute, domestic problem, theft/robbery and infidelity.

### 3.6. Accused-victim relationship

Accused victim relationship in suicides and homicides is shown in Table 6. In this, the person who is responsible for killing of the victim or one who is responsible for the victim to commit suicide is considered as “accused” and its relationship with the victim is elaborated. The relationship between accused and victim could not be ascertained even

Table 3  
Age and gender distribution of suicidal and homicidal deaths

Age groups	Suicidal deaths (n = 1127)						Homicidal deaths (n = 241)					
	M	%	F	%	T	%	M	%	F	%	T	%
00–10	0	0.0	0	0.0	0	0.0	3	1.5	2	4.5	5	2.1
11–20	74	10.5	122	28.8	196	17.4	11	5.6	1	2.3	12	5.0
21–30	273	38.8	182	43.0	455	40.4	56	28.4	15	34.1	71	29.5
31–40	217	30.8	56	13.2	273	24.2	65	33.0	20	45.5	85	35.3
41–50	81	11.5	35	8.3	116	10.3	34	17.3	3	6.8	37	15.4
51–60	42	6.0	14	3.3	56	5.0	9	4.6	2	4.5	11	4.6
61–70	14	2.0	11	2.6	25	2.2	13	6.6	1	2.3	14	5.8
71 & >	3	0.4	3	0.7	6	0.5	6	3.0	0	0.0	6	2.5
Total	704	62.5	423	37.5	1127	100.0	197	81.7	44	18.3	241	100.0

Table 4  
Distribution of marital status of the victims of suicides and homicides

Marital status	Suicidal deaths (n = 1127)				Homicidal deaths (n = 241)			
	M	F	T	%	M	F	T	%
Married	431	304	735	65.2	127	40	167	69.3
Unmarried	256	116	372	33.0	54	4	58	24.1
Not known	17	3	20	1.8	16	0	16	6.6
Total	704	423	1127	100.0	197	44	241	100.0

Table 5a  
Distribution of suicidal deaths in relation to the cause (n = 1127)

Causes/precipitating factor	M	F	T	%
Unknown	294	60	354	31.4
Chronic illness	84	70	154	13.7
Mental illness (insanity)	43	74	117	10.4
Torture by in-laws/other	4	98	102	9.1
Domestic problem	56	39	95	8.4
Quarrel	42	32	74	6.6
Under influence of alcohol	56	0	56	5.0
Failure in examination	32	11	43	3.8
Unemployment	42	0	42	3.7
Infidelity or its allegation	11	25	36	3.2
Failure in love	11	7	18	1.6
Depression	14	0	14	1.2
Feeling of remorse	4	3	7	0.6
Homicide – suicide	5	1	6	0.5
Self immolation in protest	3	0	3	0.3
Ragging	3	0	3	0.3
Issueless wife	0	3	3	0.3
Total	704	423	1127	100.0

Table 5b  
Distribution of homicidal deaths in relation to the cause (n = 241)

Causes/precipitating factor	M	F	T	%
Quarrel	80	26	106	44.0
Revenge	48	2	50	20.7
Unknown	44	1	45	18.7
Property/land dispute	6	2	8	3.3
Domestic problem	4	4	8	3.3
Theft/robbery	4	3	7	2.9
Infidelity	3	3	6	2.5
Torture by in-laws/other	1	1	2	0.8
Sexual assault	1	1	2	0.8
Insanity	2	0	2	0.8
Frustration in life	1	1	2	0.8
Jelousy	1	0	1	0.4
Failure in love	1	0	1	0.4
Eve teasing <sup>a</sup>	1	0	1	0.4
Total	197	44	241	100.0

<sup>a</sup> Eve teasing means 'euphemism' used in India for molestation or sexual harassment of women by men. It is a growing problem with varying severity from simple remarks to indecent assault.

after Magistrate's verdict report in 32.2% of the suicides in contrast to 15.8% homicides.

In suicidal deaths, the accused were having close family relationship with the victim in 61.9% cases and having no family relationship in only 5.9% of the victims. In homicidal deaths, 27.8% of the victims were killed by perpetra-

tors who were the family members of the victims and 56.4% by assailant having no family relationship with the victim.

In suicidal deaths, self was responsible in 35.9% of the victims. Spouse was accused of suicide in 11.8% and in-laws in 9.3% of the victims. In homicides, 12% of the victims were killed by their spouse and 6.2% by other relatives of the victims. In suicidal deaths, acquaintances were the accused in only 5.1% of the victims. Whereas in homicides, 28.2% of the victims were killed by acquaintances, 14.1% by criminals and 10% by strangers.

### 3.7. Crime scene

As per Table 7, in suicidal deaths, 77.7% of the victims committed suicide in their own domicile and only 12.1% of the victims committed suicide outdoor. In homicides, 49.4% of the victims were killed outdoor and 31.5% were killed in their own house. In others domicile, homicide had an edge over suicide.

### 3.8. Seasonal variation

As shown in Table 8, the highest incidence of suicidal deaths was observed in summer months of March to June comprising of 38.2% of all suicides followed by 31.4% cases occurring in rainy or monsoon season of July to October. The least suicides were observed in the winter month of November to February in 30.3% cases. In homicidal deaths, most number of deaths was seen in summer season comprising of 37.3% followed by 35.3% in rainy season and 27.4% in winter season.

## 4. Discussion

The incidence of homicide and suicide is on the increase worldwide, including India. This upward trend noticeable across the world is a matter of concern. The rising trend may be due to rapid increase in the population, unemployment, industrialization, stressful living life and day-to-day frustration. The studied cases of suicide and homicide are reliable representative of whole district. The centre is an Apex Medical Centre, where about 40% of the total medicolegal autopsies done across the district are performed here. In medicolegal deaths, autopsy is compulsory by law. The suicide rate in the region is 23.1/100,000 population per year in comparison to homicide rate of 4.9/100,000 population per year. Out of the total 5773 medicolegal

Table 6  
Accused victim relationship in suicides and homicides

Relationship	Suicidal deaths (n = 1127)				Homicidal deaths (n = 241)			
	M	F	T	%	M	F	T	%
<i>I – Close family relationship</i>								
Self	244	161	405	35.9	0	0	0	0.0
Spouse	51	82	133	11.8	2	27	29	12.0
Inlaws	26	79	105	9.3	3	1	4	1.7
Parent	17	2	19	1.7	3	2	5	2.1
Children	3	3	6	0.5	4	0	4	1.7
Brother	6	1	7	0.6	10	0	10	4.1
Others relatives	15	8	23	2.0	13	2	15	6.2
Total	362	336	698	61.9	35	32	67	27.8
<i>II – Extrafamilial relationship</i>								
Acquaintances	39	19	58	5.1	61	7	68	28.2
Strangers	0	0	0	0.0	21	3	24	10.0
Criminals	1	1	2	0.2	33	1	34	14.1
Others	5	1	6	0.5	10	0	10	4.1
Total	45	21	66	5.9	125	11	136	56.4
<i>III – Unknown</i>	297	66	363	32.2	37	1	38	15.8
Grand total	704	423	1127	100.0	197	44	241	100.0

deaths during the study period of three years, an incidence of 4.2% homicide was recorded in contrast to 19.5% suicides, with rise in the suicidal and decline in the homicidal deaths. Thus suicides were almost five times as common as homicides. Ghangle et al.<sup>2</sup> and Kachare et al.<sup>3</sup> reported an incidence of 3–4% homicidal deaths of the total medicolegal deaths. Sinha et al.<sup>4</sup> and Gupta et al.<sup>5</sup> in their study found 5.9% and 7.5% homicidal deaths, respectively. Batra et al.<sup>6</sup> noticed only 1.6% homicide out of the total medicolegal deaths. In suicidal deaths, Chavan et al.<sup>7</sup> and Kachare et al.<sup>3</sup> reported an incidence of about 19% suicide out of the total medicolegal deaths, which is very consistent with the present study. Sahoo et al.<sup>8</sup> observed 12.7% suicides of the total medicolegal deaths. Whereas Batra et al.<sup>6</sup> reported high incidence of 34.3% suicidal deaths of the total medicolegal deaths.

In the present study, poisoning was the commonest method of suicide followed by burning, hanging and drowning. Whereas blunt trauma was the commonest method of homicide followed by sharp trauma, burning and strangulation. Suicide and homicide by shooting was very rare and included in 'other' methods. In India, firearms ownership is restricted. The rules and provisions of Indian Arms Act 1959<sup>d</sup> are followed meticulously before issuing a license to possess the firearms. Local District authorities are authorized for the purpose. Although unlicensed country made firearms is easily available, especially in North–East Indian provinces, the same is very sparingly reported in the present study area.<sup>6</sup> In contrast to this,

shooting is the commonest method of suicide<sup>9,10</sup> as well as homicide<sup>9</sup> in American studies. Drug overdose in United Kingdom,<sup>11</sup> Hanging in Norway<sup>12</sup> and Belgium,<sup>13</sup> and falls from a height in Singapore<sup>14</sup> are the commonest methods of suicide. In Caribbean Inland of West Indies, hanging is the commonest method used for suicide in Jamaica in contrast to poisoning in Trinidad and Tobago.<sup>15</sup> However, in agriculture-based country like Sri Lanka<sup>16</sup> and African country like Balantyre, Malawi,<sup>17</sup> poisoning is the commonest method of suicide followed by hanging. In homicidal deaths, blunt trauma is the commonest method of homicide in Germany<sup>18</sup> and Japan.<sup>19</sup> Sharp trauma is the commonest method of homicide in Kaula Lumpur,<sup>20</sup> England and Wales<sup>21</sup> and Denmark.<sup>22</sup> Similarly in India, different regions have different methods of suicide and homicide. Burning in Delhi,<sup>23</sup> poisoning in Maharashtra<sup>6,7</sup> and hanging in Orissa<sup>8</sup> are the commonest methods of suicide. Blunt trauma in Haryana,<sup>24</sup> sharp trauma in Delhi,<sup>5</sup> Maharashtra<sup>2,6</sup> and Manipal,<sup>25</sup> and shooting in Allahabad, Uttarpradesh<sup>4</sup> are the commonest methods of homicide. Thus, the methods of suicide and homicide vary in different countries and even in the same country in different regions. Still poisoning, burning, hanging, drowning forms the major methods of suicide and blunt trauma, sharp trauma, burning, strangulation are the common methods of homicide in India.

Combined methods were more common in homicide as compared to suicide and were exclusively seen in males. In homicidal deaths it usually involved sharp trauma with blunt trauma and/or strangulation. It is possible that the victim did not die immediately after strangulation or blunt trauma or that pre-terminal gasping was considered as a sign of life, so that the perpetrator used sharp force to eliminate the

<sup>d</sup> Chapter II, Sec. 3: License for acquisition and possession of Firearms and Ammunition.



Table 7  
Distribution of victims of suicide and homicide in relation to place of crime

Crime scene	Suicide ( <i>n</i> = 1127)				Homicide ( <i>n</i> = 241)			
	M	F	T	%	M	F	T	%
Own domicile	522	354	876	77.7	38	38	76	31.5
Other domicile	38	45	83	7.4	27	4	31	12.9
Outdoor	112	24	136	12.1	118	1	119	49.4
Unknown	0	0	0	0.0	5	1	6	2.5
Others	32	0	32	2.8	9	0	9	3.7
Total	704	423	1127	100.0	197	44	241	100.0

Table 8  
Month wise distribution of victims of suicide and homicide

Month and season	Suicidal deaths ( <i>n</i> = 1127)				Homicidal deaths ( <i>n</i> = 241)			
	M	F	T	%	M	F	T	%
March	28	38	66	5.9	21	4	25	10.37
April	81	42	123	10.9	17	4	21	8.714
May	60	63	123	10.9	16	3	19	7.884
June	80	39	119	10.6	21	4	25	10.37
Summer season	249	182	431	38.2	75	15	90	37.34
July	67	17	84	7.5	16	2	18	7.469
August	63	21	84	7.5	12	8	20	8.299
September	60	20	80	7.1	19	2	21	8.714
October	73	33	106	9.4	20	6	26	10.79
Rainy season	263	91	354	31.4	67	18	85	35.27
November	56	38	94	8.3	12	1	13	5.394
December	49	35	84	7.5	12	2	14	5.809
January	42	35	77	6.8	15	2	17	7.054
February	45	42	87	7.7	16	6	22	9.129
Winter season	192	150	342	30.3	55	11	66	27.39
Grand total	704	423	1127	100.0	197	44	241	100.0

victim. Combined trauma was observed in almost 37% of homicidal cases by Fisher et al.<sup>18</sup> and 28% by Betz et al.,<sup>26</sup> 5.8% by Ghangle et al.<sup>2</sup> and 4.7% by Sinha et al.<sup>4</sup>

As similar to other authors, male predominance was seen in all methods of suicide<sup>23,27,28</sup> and homicide,<sup>2,6,24</sup> except burning. Thus in India burning is the commonest method of suicide and homicide in females, a very rare phenomenon elsewhere in the world. The Indian women faced with multiple domestic chores, pregnancies, poverty, anaemia, exhaustion, and depression probably show a protest by burning in a society that does not permit the expression of anger or frustration. Moreover suicide by burning was and still is, regarded as a permissible way of escaping an intolerable situation though the causes of hardship may have changed for Indian females. In homicidal burning too, the young women being burnt by the husband or in-laws at the stake of dowry or as a result of domestic quarrel or marital discord. However, in the western countries burning is not the common method of suicide<sup>9,10,12</sup> and homicide<sup>18</sup> and is included in other group.

In general, male predominance is seen with peak age of incidence at 21–30 years in suicide<sup>10,11</sup> and 31–40 years in homicide.<sup>26,29</sup> In present series too, most of the victims

were male with peak age 21–30 years in suicide and 31–40 years in homicide. This differs from other studies, which report highest number in over 60's age group in suicides<sup>13,14</sup> and over 40's age group in homicides<sup>18,19</sup>. However, the authors in India reported male predominance with peak age 21–30 years followed by 31–40 years in suicides<sup>3,6,7</sup> as well as homicides.<sup>2–5</sup> Thus, male predominance was seen in both suicidal and homicidal deaths but male female sex ratio was much higher in homicides. Sinha et al.<sup>4</sup> claimed predominance of male in homicide, probably due to the fact that males are concerned with violent activities and greater exposure to surroundings and responsibility to solve the family problems and disputes. At age 11–20 years, the victims of suicide outnumbered the victims of homicide. However, at the extremes of ages below 10 years and above 60 years, although least affected, the victims of homicide were relatively more common than the victims of suicide.

As in the present study, other Indian studies too reported a predominance of married victims in both suicidal<sup>7,8</sup> and homicidal deaths<sup>2,4,30</sup> with preponderance of female victims but the married unmarried ratio is more in homicides as compared to suicides. Batra et al.<sup>6</sup> claimed

marital conflicts, sterility or more issues and more financial responsibilities on the shoulder of the victim for such pre-disposition in suicides. Ghangle et al.<sup>2</sup> also claimed preponderance of married victims in homicide due to the conflicts among newly married couples, frequently subjected to torture by husband and in-laws for dowry. Moreover in the developing country like India, females are married off earlier than the males in the family and are more exposed to social and family stress much earlier than males.

Although the motives for suicide are difficult to judge during the medicolegal investigation, each suicide was evaluated and the chief cause/motive or precipitant factor was identified. As noted with other series, chronic illness and mental illness were the most common cause of suicide<sup>7</sup> in contrast to quarrel and revenge for homicide.<sup>5,30</sup> This differs from other study which report psychiatric problem as the predominant antecedent events for suicide followed by alcoholic, love and health problem whereas quarrel as the most precipitating factor of homicide followed by robbery and love problem.<sup>9</sup> Hettiarachchi et al.<sup>16</sup> reported depression as the commonest reason for committing suicides. Sinha et al.<sup>4</sup> noted property disputes and quarrel as the common motive for homicide.

In 61.9% and 27.8% deaths, the accused that were the family members of the victims were responsible for suicide and homicide respectively. The most common relationship was the victim's them 'self' followed by spouse in suicidal death in contrast to spouse and other relatives in homicidal death. In 5.9% and 56.4% deaths, the accused having no family relationship with the victims were responsible for suicide and homicide respectively. Acquaintances were responsible in only 5.1% of the suicides in contrast to 28.2% homicides. As stated by Scott<sup>11</sup> and Kominato et al.,<sup>19</sup> close family relationship was reported in 43% and 58.5% of the homicides respectively. Kominato et al.<sup>19</sup> also reported 69.2% of homicides by acquaintances and 30.8% by perpetrator not acquainted with their victims, which are in sharp contrast to that of suicides.

Another striking difference in suicide and homicide was the crime scene. In general, suicide prefers the safe closed environment in ones own domicile so as not to be rescued by other and homicides are common outdoor. In suicidal deaths, most of the victims committed suicide in their own domicile (77.7%) in contrast to 31.5% in homicide. In homicidal deaths, most of the victims were killed outdoor (49.4%) and only 12.1% of victims committed suicide outdoor. This is inconsistent with that of Rodge et al.<sup>22</sup> and Kominato et al.<sup>19</sup> who found almost 59% and 80% of the victims to be killed in one's own domicile respectively.

In the present study, most of the victims of suicide and homicide were observed in summer season of March to June with peak in the months of April and May in suicidal deaths and October in homicidal deaths. The least suicides and homicides were observed in winter months of November to February. Nevertheless, larger seasonal variation was not seen in both suicides as well as homicides. The results of the present study indicate that the suicide curve

by month is more or less similar to that in the temperate countries, i.e. a drop during the winter months of November to February and rise in March and April,<sup>31</sup> the slight difference being that the peak is found in April and May in the present study, the difference is most probably due to change in months of the corresponding season at two places. Durkheim<sup>32</sup> believed that seasonal variation of suicidal behaviour was determined by the intensity of communal life and the activity. He predicted, therefore, that rural communities, in whom there would be a larger variation in the pace of the life, would show a correspondingly larger variation in suicidal rates when compared with big cities. Parker and Walter<sup>33</sup> reported the minimal variation in Australia, which is highly urbanised country. Lester<sup>9</sup> and Bennett et al.<sup>10</sup> reported no obvious seasonal variation in the suicidal deaths but noted declined from late November to early January. However, Scott<sup>11</sup> reported slight predominance of suicidal deaths in winter season. Lester<sup>9</sup> and Gill et al.<sup>34</sup> found maximum number of homicides in summer season, which is in sharp contrast to that of Mohanty et al.<sup>25</sup> and Dikshit et al.<sup>35</sup> who recorded maximum cases during winter season. Sinha et al.<sup>4</sup> and Sheikh et al.<sup>30</sup> observed maximum homicides during rainy season of July to October and claimed to be due to sowing season in the rural areas. However, Gupta et al.<sup>5</sup> in Delhi reported equal number of homicides during the winter and summer season. The possible reasons for seasonal difference in suicides and homicides in different regions can be approached from the climatic, biological, socio-economical, religion and cultural viewpoints. Kok and Tsoi<sup>31</sup> observed a significant relationship between young suicides and the weather conditions. They reported that the young tend to be affected by dry, hot and windless weather and that a high temperature accounted for about 58% of the variations in the total suicide number in the young. Hence, probably the sensitivity to the unfavourable weather could predispose the young people to suicide or homicide, as the adaptation level to heat could be less.

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## References

1. WHO. Handle life with care. Information material no. WHO/2, New Delhi, India: SEARO; 1993.

2. Ghangle AL, Dhawane SG, Mukherjee AA. Study of homicidal deaths at Indira Gandhi Medical College, Nagpur. *J Forensic Med Toxicol* 2003;**20**(1):47–51.
3. Kachare RV, Chavan KD, Goli SK. Analytical study of medicolegal deaths in rural region of beed district of Maharashtra. *J Medicolegal Assoc Maharashtra* 2003;**15**:14–7.
4. Sinha US, Kapoor AK, Pandey SK. Pattern of homicidal deaths in SRN hospital's mortuary at Allahabad. *J Forensic Med Toxicol* 2003;**20**(2):33–6.
5. Gupta A, Mukta Rani, Mittal AK, Dikshit PC. A study of homicidal deaths in Delhi. *Med Sci Law* 2004;**44**(2):127–32.
6. Batra AK, Dongre AP. A preliminary analysis of medicolegal autopsies performed over five years in a rural health district of Maharashtra State of India. *J Forensic Med Toxicol* 2003;**20**(1):41–6.
7. Chavan KD, Kachare RV, Goli SK. Study of suicidal death in rural region of Beed district of Maharashtra. *Int J Med Tox, Legal Med* 1999;**1**(2):29–31.
8. Sahoo PC, Das BK, Mohanty MK, Acharya S. Trends in suicide – a study in MKCG Medical College PM Centre. *J Forensic Med Toxicol* 1999;**16**(1):34–5.
9. Lester D. Suicide and homicide in Costa Rica. *Med Sci Law* 1995;**35**(4):316–8.
10. Bennett AT, Collins KA. Suicide: a ten years retrospective study. *J Forensic Sci* 2000;**45**(6):1256–8.
11. Scott KWM. Suicide in Wolverhampton – 1976 to 1990. *Med Sci Law* 1994;**34**(2):99–105.
12. Morild I. Fractures of neck structures in suicidal hanging. *Med Sci Law* 1996;**36**(1):80–4.
13. Moens GFG, Loysch MJM, Honggokoesoemo S, VandeVoorde H. Recent trends in methods of suicide. *Acta Psychiat Scand* 1989;**79**:207–15.
14. Liang Ng DW, Lau G. Suicide trends in Singapore: two decades down the road. *Med Sci Law* 2003;**43**(2):141–7.
15. Escoffery C, Shirley SE. Fatal poisoning in Jamaica: a Coroner's autopsy study from the university hospital of the West Indies. *Med Sci Law* 2004;**44**(2):116–20.
16. Hettiarachchi J, Kodithuwakku GCS, Chandrasiri N. Suicide in southern Srilanka. *Med Sci Law* 1988;**28**(3):248–51.
17. Dzamalala CP, Milner DA, Liomba NG. Suicide in Blantyre, Malawi (2000–2003). *J Clin Forensic Med* 2006;**13**(2):65–9.
18. Fischer J, Kleeman WJ, Troger HD. Type of trauma in cases of homicide. *Forensic Sci Int* 1994;**68**:161–7.
19. Kominato Y, Shimada I, Hata N, Takizawa H. Homicide patterns in the toyama prefecture, Japan. *Med Sci Law* 1997;**37**(4):316–20.
20. Virendra Kumar, Khaw Mae Li Adeline, Ahmad Zaid Zainal, Ai Lee leh, Syahrul Anuar Salleh. A study of homicidal deaths in medicolegal autopsies at UMMC, Kuala Lumpur. *J Clin For Med* 2005;**12**(5):254–7.
21. Rouse DA. Pattern of stab wounds: a six-year study. *Med Sci Law* 1994;**34**(1):67–71.
22. Rogde S, Hougen HP, Poulsen K. Homicide by sharp force in two Scandinavian capitals. *For Sci Int* 2000;**109**:135–45.
23. Bharat Singh, Ganeson D, Chattopadhyay PK. Pattern of suicides in Delhi – a study of the cases reported at the police morgue, Delhi. *Med Sci Law* 1982;**22**(3):195–8.
24. Pal V, Paliwal PK, Yadav DR. Profile of regional injuries and weapons used in homicidal victims in Haryana. *J Forensic Med Toxicol* 1994;**11**(2):42–4.
25. Mohanty MK, Mohan Kumar TS, Arun Mohanram, Vikram Palimar. Victims of homicidal deaths – an analysis of variables. *J Clin For Med* 2005;**12**(6):302–4.
26. Betz P, Eisenmenger W. Comparison of wound patterns in homicide and dyadic death. *Med Sci Law* 1997;**37**(1):19–22.
27. Singh Dalbir, Jash PK, Tyagi S. Recent trends in burn mortality in Northwest India and its preventive aspect. *J Indian Acad For Med* 1997;**19**(4):79–88.
28. Kumar V, Tripathi CB, Kanth S. Burnt wives – a circumstantial approach. *J Forensic Med Toxicol* 2001;**18**(2):14–9.
29. Preti A, Miotto P. Death by homicide in Italy, 1980–94: age and gender differences among victims. *Med Sci Law* 2000;**40**(3):233–9.
30. Sheikh I, Subrahmanyam BV. Study of homicide with special reference to changing trends. *J Forensic Med Toxicol* 1995;**12**:8–15.
31. Kok LP, Tsoi WF. Season, climate and suicide in Singapore. *Med Sci Law* 1993;**33**(3):247–52.
32. Durkheim E. *Le Suicide Paris 1897. Suicide, a study in sociology*. New York: Free Press; 1951. Translated by Spaulding SA, Simpson G.
33. Parker G, Walter S. Seasonal variation in depressive disorders and suicidal deaths in new South Wales. *Br J Psychiat* 1982;**140**:626–32.
34. Gill JR, Catanese CI. Sharp injury fatalities in New York city. *J Forensic Sci* 2002;**47**(3):554–7.
35. Dikshit PC, Kumar A. Study of homicidal deaths in Central Delhi. *J Forensic Med Toxicol* 1997;**14**(1):44–6.